THE

Connecticut Agricultural Experiment Station.

NEW HAVEN, CONN.

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* Bulletin 112, June 1892, "On the Gunning-Kjeldahl Method and a Modification applicable in the presence of Nitrates by A. L. Winton, Jr." was sent only to Station Workers and Chemical Journals.

Notice as to Bulletins.

The Bulletins of this Station, issued quarterly or oftener, are mailed free to citizens of Connecticut who apply for them, and to others, as far as the limited editions permit.

Applications should be renewed annually before January 1st.

Citizens of other States desiring to secure the Bulletins regularly are referred to notice below.

The matter of all the Bulletins of this Station in so far as it is new and of permanent value will be made part of the Annual Report of the Director.

Bulletins earlier than No. 71 and Nos. 83, 93, 100, 101 and 102 are exhausted and cannot be supplied.

Notice as to Supply of Station Reports.

The Annual Report of this Station for 1891, printed at State expense, is limited to an edition of 7,000 copies, of which 5,000 copies are bound and distributed by the Secretary of the Board of Agriculture, T. S. Gold, West Cornwall, Conn.

After satisfying necessary exchanges, the copies remaining at the disposal of the Station have been sent to citizens of Connecticut, who made application for them, until our supply is exhausted.

The Station has no supply of its Annual Reports for the years 1877, 1878, 1879, 1880, 1881, 1883, and 1887, and will pay a liberal price for a number of clean copies of Reports for any of these years.

Extra copies of the next Annual Report can be secured if called for before the printing-forms are broken up. Such copies will be struck off and supplied early next year to citizens of other States who apply to this Station before February 1st, and who remit 25 cents per copy to defray costs. This remittance will also secure to the sender the Bulletins issued by this Station during the year.

Coin may be forwarded by Post at sender's risk with small chance of loss, as follows: Cut an inch hole in a card or scrap of paper-box that will just fit inside an envelope, fasten a twenty-five cent piece in the cavity by pasting paper over it on both sides of the card, write thereon name and Post office address, inclose within an envelope, and send as a letter prepaid in full. P. O. stamps cannot be accepted.

The Trade-Values for 1892 of Fertilizing Ingredients in Raw Materials and Chemicals.

The average Trade-Values or *retail cost per pound* of the ordinarily occurring forms of nitrogen, phosphoric acid and potash are as follows:

	Cts. per lb.
Nitrogen in ammonia salts	17½
nitrates	15
Organic nitrogen in dry and fine ground fish, meat and blood	16
in cotton seed meal and castor-pomace	15
in fine bone and tankage	15
in fine medium bone and tankage	12
in medium bone and tankage	9½
in coarser bone and tankage	7½
in hair, horn shavings and coarse fish scrap	7
Phosphoric acid, soluble in water	7½
in ammonium citrate*	7
in dry ground fish, fine bone and tankage	7
in fine-medium bone and tankage	5½
in medium bone and tankage	4½
in coarser bone and tankage	3
Potash as high-grade Sulphate and in forms free from Muriate (or Chlorides)	5½
as muriate	4½

These Trade-Values are the average prices at which in the six months preceding March the respective ingredients could be bought at retail for cash in our large markets, Boston, New York and Philadelphia, in the raw materials which are the regular source of supply. They also correspond to the average wholesale prices for the six months ending March 1st, plus about 20 per cent. in case of goods for which we have wholesale quotations. They have been agreed upon by the Experiment Stations of Massachusetts, New Jersey, Rhode Island and Connecticut for use in their respective States during 1892. The valuations obtained by use of the above figures will be found to agree fairly with the *average retail price* at the large markets of standard raw materials such as:

* Dissolved from 2 grams of the unground phosphate previously extracted with pure water, by 100 c. c. neutral solution of Ammonium Citrate, sp. gr. 1.09, in 30 minutes, at 65° C., with agitation once in five minutes. Commonly called "reverted" or "backgone" Phosphoric Acid.

Sulphate of Ammonia,	Azotin,
Nitrate of Soda,	Ammonite,
Dried Blood,	Dry Ground Fish,
Muriate of Potash,	Bone or Tankage,
Sulphate of Potash,	Ground So. Carolina Rock,

Plain Superphosphate.

Valuation of Superphosphates, Special Manures and Mixed Fertilizers of High Grade.

The Valuation of a Fertilizer consists in calculating the *retail Trade-value* or *cash-cost* at trade centers (in raw materials of good quality) of an amount of nitrogen, phosphoric acid and potash equal to that contained in one ton of the fertilizer.

To obtain the valuation of a Fertilizer we multiply the pounds per ton of Nitrogen, etc., by the trade-value per pound. We thus get the values per ton of the several ingredients, and adding them together we obtain the total valuation per ton.

Organic nitrogen in Mixed Fertilizers is reckoned at 16 cents, the price of nitrogen in raw materials of the best quality.

Insoluble Phosphoric Acid is reckoned at 2 cents. Potash is rated at 4½ cents, if sufficient chlorine is present in the fertilizer to combine with it to make muriate. If there is more Potash present than will combine with the chlorine, then this excess of potash is reckoned at 5½ cents.

In most cases the valuation of the Ingredients, in Superphosphates and Specials falls below the retail cash price charged for these goods at the factory. The difference between the two figures represents the manufacturer's charges for converting raw materials into manufactured articles and selling them. These charges are for grinding and mixing, bagging or barreling, storage, commission to agents and dealers, interest on investment, and finally, profits. If the purchaser buys on credit, the price of the fertilizer is commonly made to cover interest.

Cotton Seed Meal.

This article is comparatively uniform in quality. The average composition of the nine samples analyzed this year is nitrogen 7.06 per cent., phosphoric acid 2.67 per cent., potash 1.73 per cent. The average cost of nitrogen in cotton seed meal has been 14.9 cents per pound and the extremes were 14.0 and 16.3 cents per pound.

Analyses of Cotton Seed Meal.

Station No.	Dealer.	Sampled by	Chemical Analysis.			Cost per ton.	Nitrogen cost per pound in cents.*
			Nitrogen.	Phosphoric Acid.	Potash.		
3470	E. S. Hough, Poquonock,	Eugene Brown, Poquonock,	7.13	2.79	1.90	$26.00	14.03
3471	" "	" "	7.15	2.80	1.79	26.00	14.06
3469	Olds & Whipple, Hartford,	" "	7.11	2.78	1.85	26.00	14.12
3495	" "	Station Agent,	6.97	2.21	1.83	†25.00	14.30
3451	E. A. Buck & Co., Willimantic,	S. O. Griswold, Poquonock.	6.91	2.56	1.93	26.00	14.70
3447	Olds & Whipple, Hartford,	E. J. Wells, East Windsor Hill,	6.60	3.30	2.13	27.00	15.20
3441	" "	Walter Smith, Windsor,	7.52	2.15	.99	28.00	15.80
3418	J. S. Marsh, New Milford,	E. A. Wildman, New Milford,	7.12	3.10	1.80	29.00	15.90
3442	Olds & Whipple, Hartford,	G. H. Fitch, Windsor,	6.99	2 32	1.37	27.50	16.30

* Valuing phosphoric acid and potash at 7 cents and 5½ cents per pound respectively.
† Off color.

Cotton Hull Ashes.

In the following table are given all the analyses of Cotton Hull Ashes which have been made at this Station during the present season. Samples No. **3473** and **3636** represent car lots which were admitted to be of inferior quality, and were sold after analysis, at a low price.

The average cost of the ashes excluding the last four samples in the table was $36.31 per ton, and the average valuation $40.57. Or differently expressed, water-soluble potash cost 4.8 cents on the average. In individual cases water-soluble potash cost 3.2 cents per pound at the lowest and 6.3 cents at the highest.

It has been impossible to supply the demand for Cotton Hull Ashes in Connecticut this year and it is stated that, as the hulls are now being used for the manufacture of paper, the supply of ashes is likely to be very limited if not absolutely cut off another year.

These ashes were first brought to our notice in 1884 by Mr. R. E. Pinney of Suffield. On learning their chemical composition and value as a source of potash, he bought that year considerable quantities, which were tried on tobacco land by him and others in his neighborhood with the best results. Since then they have come into great demand as a tobacco fertilizer in the Connecticut Valley and have furnished the growers who used them, with available potash generally at very low rates. In the near future probably some "potash-salt" will have to take the place of these ashes.

Analyses of Cotton Hull Ashes.

Station No.	Dealer or Purchaser.	Sampled by	Soluble Phosphoric Acid.	"Reverted" Phosphoric Acid.	Insoluble Phosphoric Acid.	Potash Soluble in Water.	Cost per ton.	Valuation per ton.	Potash costs per pound in cents.
3460	H. K. Brainard, Thompsonville,	R. L. Clapp, Thompsonville,	2.08	7.64	1.03	28.26	$36.00	$49.03	3.2
3423	T. Soule & Co., New Milford,	E. A. Wildman, New Milford,	2.96	6.69	1.63	31.34	35.00	49.93	3.3
3453	Olds & Whipple, Hartford,	H. S. Frye, Poquonock,	2.64	7.06	2.75	29.42	40.00	47.30	4.3
3446	Olds & Whipple, Hartford,	E. J. Wells, East Windsor Hill,	2.37	7.37	2.82	28.46	40.00	46.31	4.4
3444	H. K. Brainard, Thompsonville,	G. F. Chapin, Thompsonville,	2.34	6.15	2.72	28.96	36.00	45.07	3.9
3434	W. J. Barber, Canton,	Dealer,	1.17	7.46	2.03	28.37	40.00	44.23	4.7
3468	Olds & Whipple, Hartford,	J. M. Brown, Poquonock,	1.04	8.82	2.55	25 82	40.00	43.33	4.9
3424	T. Soule & Co., New Milford,	E. A. Wildman, New Milford,	2.24	6.23	1.38	27.53	35.00	42.91	4.1
3463	H. K. Brainard, Thompsonville,	James Wood, West Suffield,	1.84	7.63	1.46	26.14	33.00	42.78	3.6
3472	Olds & Whipple, Hartford,	Eugene Brown, Poquonock,	2.40	7.10	1.89	25.88	37.00	42.77	4.4
3475	I. L. Spencer, Suffield,	C. W. Austin, Suffield,	1.47	6.27	2.17	27.09	35.00	41.56	4.3
3435	W. J. Barber, Canton.	Dealer,	1.28	6.01	2.94	24.18	35.00	38.11	4.8
3414	Olds & Whipple, Hartford,	Dealers,	.59	7.77	1.53	22.07	35.00	36.67	5.1
3425	I. L. Spencer, Suffield.	L. F. Woodworth, Thompsonville,	1.04	7.51	2.94	20.44	35.00	35.73	5 3
3465	D. L. Brockett, Suffield,	Dealer,	.50	6.85	1.41	21.54	36.00	34 59	5.8
3433	R. E. Pinney, Suffield,	F. C. Root, Suffield,	1.02	6.08	2.17	21.40	37.00	34.45	6.1
3452	G. H. & J. H. Hale, Glastonbury,	S. O. Griswold, Poquonock,	1.34	5.67	2.67	20.90	37.00	34.01	6.2
3422	A. D. Bridge, Hazardville,	W. P. Henry, Scitico,	.64	8.22	2.05	17.22	35.00	32.23	6.3
3436	E. S. Clark, Hartford.	Purchaser,	none	4.23	1.81	21.00	33.00*	29.74	6.3
3623	Seth Viets, West Suffield,	F. C. Root, Suffield,	.74	6.75	2.07	16.02	42.00	29.01	9.5
3622	Seth Viets, West Suffield,	F. C. Root, Suffield,	.80	5.60	3.00	11.27	36.00	22.63	11.4
3636	J. E. Soper & Co., Boston,	Arthur Sikes, Suffield,	.93	3.17	1.57	8.67	16.01	16.01	5.5
3473	J. E. Soper & Co., Boston,	Arthur Sikes, Suffield,	.24	3.40	1.30	7.02	....	13.36	---

* By car load.